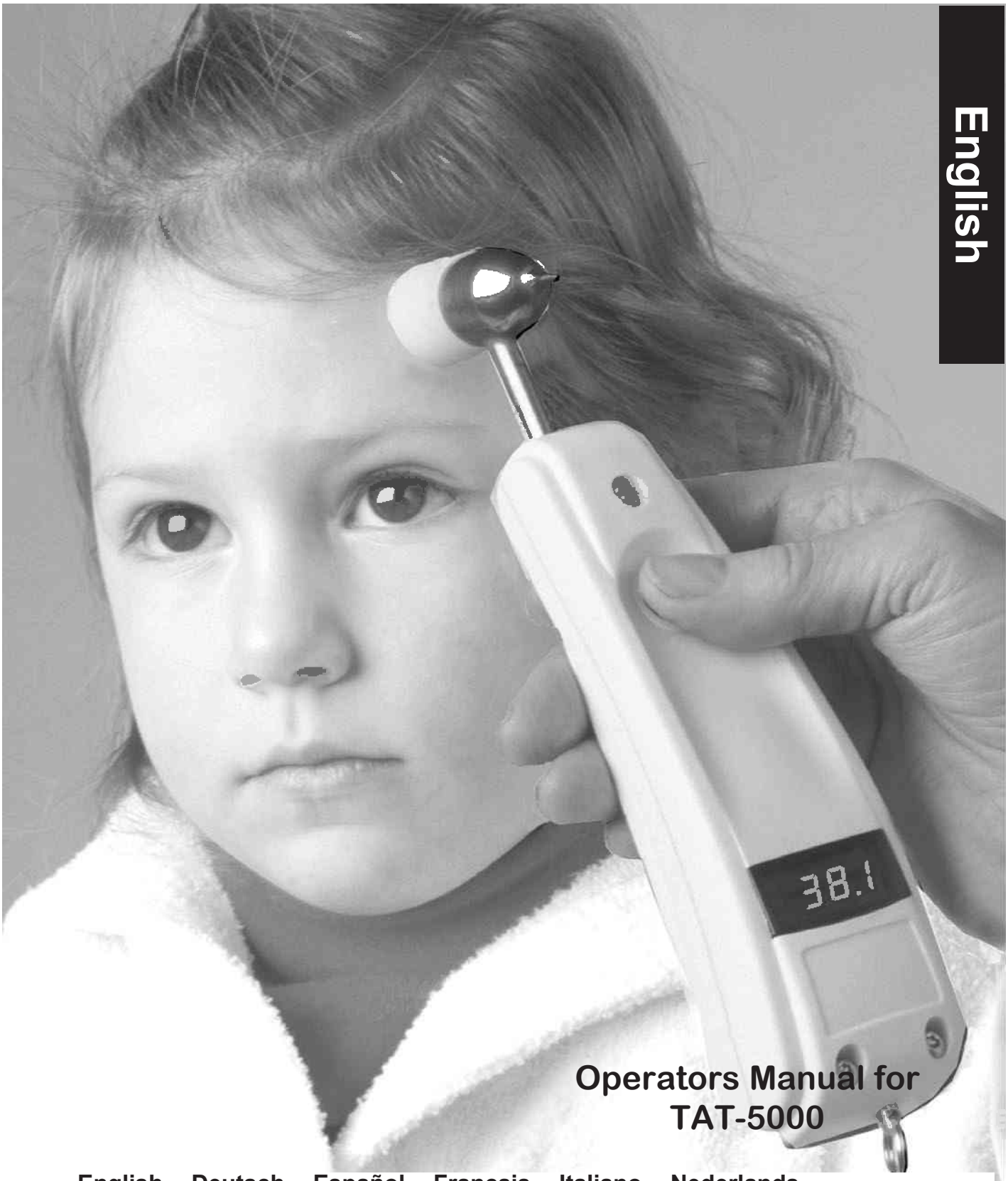
EXERGEN

TemporalScanner™

exergen.com/s

Accurate Temperature with a Gentle Forehead Scan

English



Operators Manual for TAT-5000

English ~ Deutsch ~ Español ~ Français ~ Italiano ~ Nederlands ~ Português (UE) ~ Türkçe ~ Česky ~ Svenska ~ Dansk ~ Norsk

Important Safety Instructions

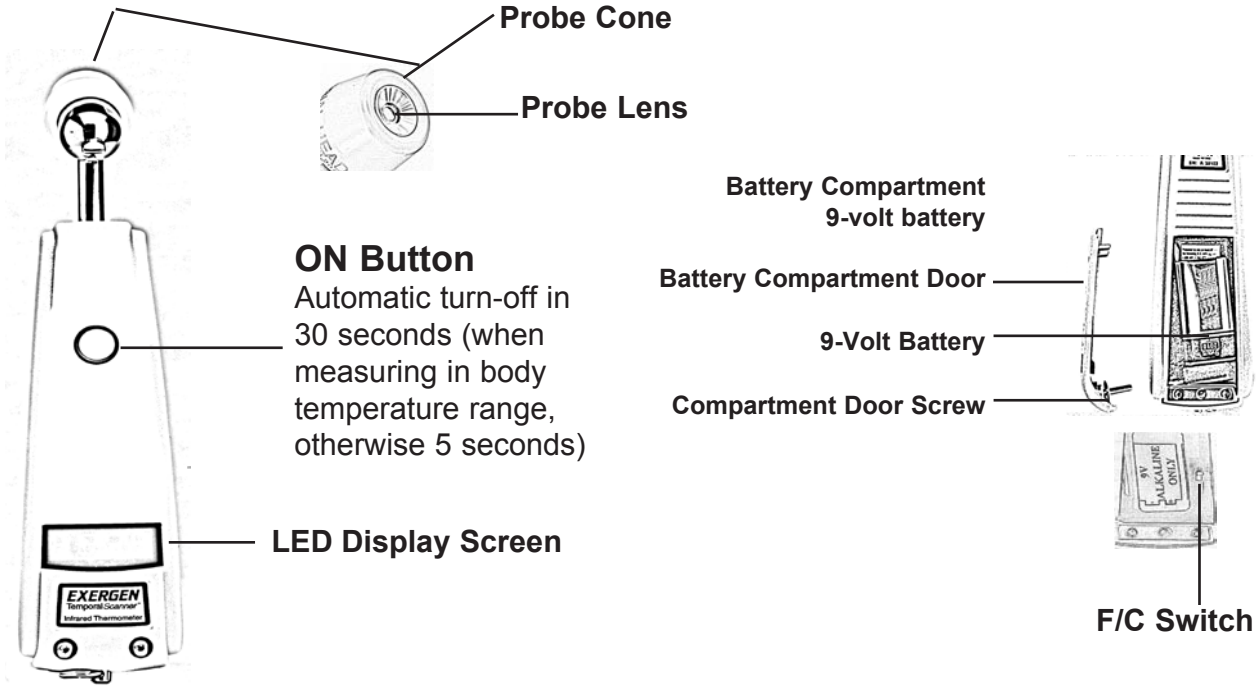
READ ALL INSTRUCTIONS BEFORE USING

When using the product, basic safety precautions should always be followed, including the following:

- Use this product only for its intended use as described in this manual.
- Do not take temperature over scar tissue, open sores, or abrasions.
- The operating environmental temperature range for this product is 60° to 104°F (15.5° to 40°C).
- Always store and transport this thermometer in a clean, dry place where it will not become excessively cold (-4°F/-20°C), or hot (122°F/50°C). Relative humidity 93% Maximum Non-Condensing, atmospheric pressure 50 kpa to 106 kpa.
- The thermometer is not shockproof. Do not drop it or expose it to electrical shocks.
- Do not autoclave. Please note cleaning and sterilizing procedures in this manual.
- Do not use this thermometer if it is not working properly, if it has been exposed to temperature extremes, damaged, been subject to electrical shocks or immersed in water.
- There are no parts that you can service yourself except for the battery, which you should replace when low by following the instructions in this manual. For service, repair, or adjustments, return your thermometer to Exergen. Warning no modification of this equipment is allowed.
- Never drop or insert any object into any opening.
- If your thermometer is not used regularly, remove the battery to prevent possible damage due to chemical leakage.
- Follow the battery manufacturer's recommendations or your hospital policy for the disposal of used batteries.
- Not suitable for use in the presence of flammable anaesthetic mixtures.
- If you have any additional questions regarding use or care of the thermometer, please see www.exergen.com or call customer service at (617) 923-9900.

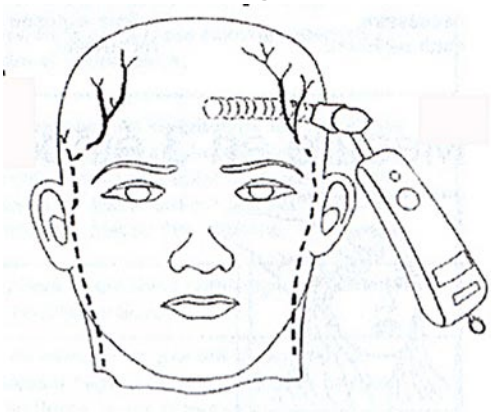
SAVE THESE INSTRUCTIONS.

Product Map of the Exergen Temporal*Scanner* TAT-5000



Introduction to Temporal Artery Thermometry

Temporal artery thermometry (TAT) is a completely new method of temperature assessment, using infrared technology to detect the heat naturally emitting from the skin surface. In addition, and of key importance, this method incorporates a patented arterial heat balance system to automatically account for the effects of ambient temperature on the skin.



This method of temperature assessment has been shown to improve results and reduce costs by non-invasively measuring body temperature with a degree of clinical accuracy unachievable with any other thermometry method. The temporal scanner is a type BF device.

Before Using, Familiarize Yourself with the Instrument

- **To Scan:** Depress the red button. The instrument will continually scan for the highest temperature (peak) as long as the button is depressed.
- **Clicking:** Each fast click indicates a rise to a higher temperature, similar to a radar detector. Slow clicking indicates that the instrument is still scanning, but not finding any higher temperature.
- **To Retain or Lock Reading:** The reading will remain on the display for 30 seconds after button is released. If measuring room temperature, the temperature will remain on the display for only 5 seconds.
- **To Restart:** Depress the button to restart. It is not necessary to wait until the display is clear, thethermometer will immediately begin a new scan each time the button is depressed.

Alternate sites when temporal artery or behind ear are unavailable:

- Femoral artery: slowly slide the probe across groin.
- Lateral thoracic artery: slowly scan side-to-side in the area ~midway between the axilla and the nipple.

2-Step Infant Temperature Measurement

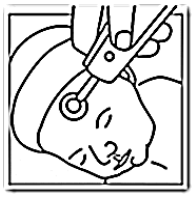
Step 1

Place probe flush on center of forehead and depress button. Keeping button depressed, slowly slide probe mid-line across forehead to the hair line.

Step 2

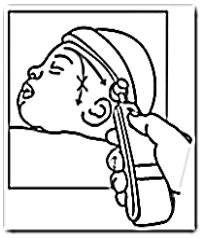
Release button remove from head and read.

How to improve the accuracy of your measurements on infants



The preferred site is the temporal artery area. Unless visibly diaphoretic, one measurement here is typically all that is required.

If the temporal artery is covered, then the area behind the ear, if exposed, can be an alternate site.



Measure straight across the forehead and not down side of face.
At mid-line, the temporal artery is about 2 mm below the surface, but can go deeply below the surface on the side of the face.

Brush the hair aside if covering the area to be measured. Measurement site must be exposed.

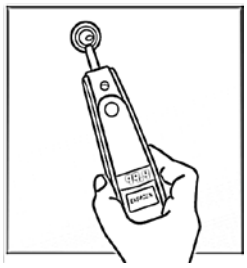
3-Step Adult Temperature Measurement

Step 1

Slide across forehead.
Place probe flush on center of forehead and depress button. Keeping button depressed slowly slide probe mid-line across forehead to the hair line.

Step 2

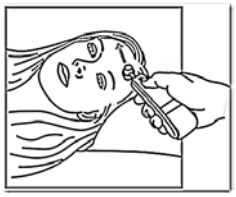
Slide behind ear.
Keeping button depressed, lift probe from forehead, touch behind ear halfway down the mastoid process and slide down to the soft depression behind the earlobe.



Step 3

Release button and read.

How to improve the accuracy of your measurements on adults



Measure only the up-side on a patient in a lateral position.
The down-side will be insulated preventing the heat from dissipating, resulting in falsely high readings.

Think of a sweatband.
Measure straight across the forehead and not down the side of the face.
At mid-line, the temporal artery is about 2 mm below the surface, but can go deeply below the surface on the side of the face.

Measure exposed skin.

Brush the hair and bangs aside if covering the area to be measured.

FAQs

How does the temperature from a temporal scanner relate to core temperature?

Temporal artery temperature is considered a core temperature because it has been demonstrated as accurate as the temperature measured by a pulmonary artery and esophageal catheter, and as accurate as a rectal temperature on a stable patient. Rule of thumb: Rectal temperature is about 1°F (0.5°C) higher than an oral temperature and 2°F (1°C) higher than an axillary temperature. It will be easy to remember if you think of core temperature as a rectal temperature, and apply the same protocol you would use for a rectal temperature.

If your thermometer is marked Arterial/Oral and has a serial number beginning with “O” (standard model start with “A”), it is programmed to compute the normal average cooling effect at the mouth, and automatically reduces the higher arterial temperature by that amount. This calibration allows the hospital to maintain existing protocols for fever workups based on oral temperature, and results in a reading consistent with the 98.6°F (37°C) mean normal oral temperature, in the range of 96.6 - 99.5°F (35.9 - 37.5°C) you now see.

What should I do if I get an abnormally high or low reading, how do I confirm my reading?

- Repeat the reading with the same Temporal Scanner; a correct reading will be reproducible.
- Repeat the reading with another Temporal Scanner. Two Temporal Scanners with the same reading will confirm the reading.
- Sequential readings on the same patient in rapid succession will cool the skin; it is best to wait about 30 seconds for the skin to recover from the cold probe.

Possible causes of abnormal readings.

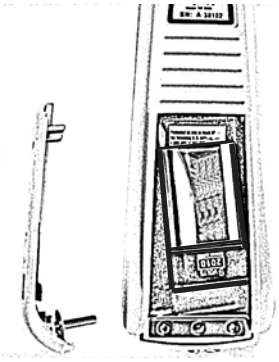
Type of abnormal Temperature	Possible cause	Helpful hint
Abnormally low Temperature	Dirty Lens	Clean lens of scanner every two weeks.
	Releasing the button before finished measuring	Release the button after finished measuring.
	Measuring when an ice pack or wet compress is on the forehead	Remove ice pack or wet compres, wait 2 minutes, and re-take temperature.
	Measuring a completely diaphoretic patient	Complete diaphoresis includes diaphoresis of area behind the ear and suggests that the temperature is rapidly dropping. Use an alternative method of temperature measurement in these cases until the patient is dry and the temporal artery measurement can be repeated.
	Improperly scanning down the side of the face	Scan straight across forehead. The temporal artery is closest to skin in that area.
Abnormally high temperature	Anything covering the area to be measured would insulate and prevent heat from dissipating, resulting in false high readings.	Confirm measurement site has not recently been in contact with heat insulators such as hats, blankets, and hair. Scan the area not covered or wait about 30 seconds for the previously covered area to equillibrate to the environment.

DISPLAY DIAGNOSTICS CHART

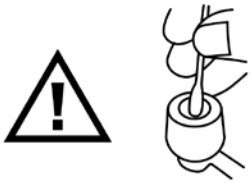
The following chart summarizes the conditions that may occur while the Temporal*Scanner* is in use, and the associated indications:

Condition	Display	Range
High Target	HI	>110 °F (43 °C)
Low Target	LO	<61 °F (16 °C)
High Ambient	HI A	>104 °F (40 °C)
Low Ambient	LO A	<60 °F (16 °C)
Low Battery	bAtt	
Dead Battery	blank display	
Processing Error	Err	Restart. Return to Exergen for repair if error message persists.
Scanning (Normal Operation)	SCAN	

Care and Maintenance



- **Battery:** A standard alkaline 9V battery provides approximately 15,000 readings. ** To replace, loosen the single screw at the bottom of the instrument and remove the battery cover. Disconnect the old battery and replace with a new one in the same location. Replace the cover, and tighten the screw. Use only high quality alkaline batteries.
- **Handling:** The Temporal*Scanner* is designed and built to industrial durability standards in order to provide long and trouble-free service. However, it is also a high precision optical instrument, and should be accorded the same degree of care in handling as you would provide other precision optical instruments, such as cameras or otoscopes.
- **Cleaning the case:** The Temporal*Scanner* case can be wiped down using a cloth dampened with 70% isopropanol alcohol.
- **Cleaning the sensor lens:** With normal use, the only maintenance required is to keep the lens on the end of the probe clean. It is made of special mirror-like, coated silicon infrared-transmitting material. However, dirt, greasy films or moisture on the lens will interfere with the passage of infrared heat and affect the accuracy of the instrument. Regularly clean the lens with a cotton swab dampened with an alcohol wipe. Use only light force for cleaning, to avoid damaging the lens. Water can be used to remove any residual film left by the alcohol. Do not use bleach or other cleaning solutions on the sensor lens. Use 70% isopropanol alcohol.

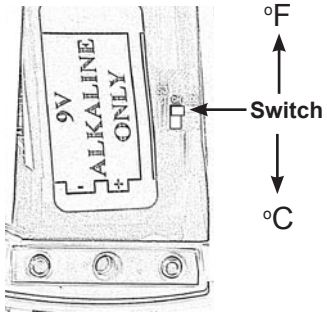


CLEANING INSTRUCTIONS

- **Disinfection:** The industrial grade housing and design of the electronic components allow for completely safe disinfecting with 70% isopropanol alcohol. Do not immerse. Do not autoclave.
- **Calibration:** Factory calibration data is installed via a computer which communicates with the Temporal*Scanner's* microprocessor. The instrument automatically self-calibrates each time it is turned on using this data, and will never require recalibration. If readings are not correct, the instrument should be returned for repair. See instructions of the return process.

Instructions for Fahrenheit or Celsius Conversion

The Temporal*Scanner* can be used in either °F or °C. The Temporal*Scanner* will come preset based on your preference at the time of purchase. To convert from one scale to the other, the only tool necessary is a small screwdriver.



For °F/°C Conversion:

- Loosen single screw on bottom of case and remove battery cover.
- Remove battery.
- Locate the switch to the right of the battery (shown in the drawing), and with the tip of the screwdriver, slide up or down to the desired scale.
- Remove the screwdriver.
- Replace battery and cover.

Repair

If repair is required:

- Contact Exergen at (617) 923-9900 or repairs@exergen.com for a Return Materials Authorization (RMA) Number.
- Mark the RMA number on the outside of your package and packing slips.
- Include a description of the fault if possible.
- Send the instrument to:

  Exergen Corporation

  400 Pleasant Street

  Watertown, MA 02472 USA
- Include the address the instrument should be returned to.

Guidance and manufacturer's declaration-electromagnetic emissions

The infrared forehead thermometer model TAT 5000 series is intended for use in the electromagnetic environment specified below. The customer or user of the TAT 5000 series should assure that it is used in such an environment.

Emissions test	Compliance	Electromagnetic environment-guidance
RF emissions CISPR 11	Group 1	The TAT 5000 series thermometer uses no RF energy therefore any emissions are unlikely to cause any interference in nearby electronic equipment
RF emissions CISPR 11	Class B	The TAT 5000 series thermometer is suitable for use by a healthcare professional in a typical health care environment.
Harmonic emissions	Not applicable	
Voltage fluctuations	Not applicable	

Guidance and manufacturer's declaration-electromagnetic immunity

The TAT 5000 series thermometer is intended for use in the electromagnetic environment specified below. The customer or user of the TAT 5000 series should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment-guidance
Conducted RF IEC 61000-4-3	3Vrms 150 kHz to 80 MHz	Not applicable	Portable and mobile RF communications equipment should be used no closer to any part of the TAT 5000 series including cables if applicable, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d=1,2*P^{1/2}$ $d=1,2*P^{1/2}$ 80 MHz to 800MHz $d=1,2*P^{1/2}$ 800MHz to 2,5 GHz Where P is the maximum output power rating of the transmitter in watts(W) according to the transmitter manufacturer and d is the recommended separation distance in meters(m). Field strength from the fixer RF transmitters, as determined by an electromagnetic site survey, a. should be less than the compliance level in each frequency range and b. interference may occur in the vicinity of equipment with the following symbol:
Radiated RF IEC 61000-4-3	3V/m 80 MHz to 2,5 GHz	3V/m	

Note 1 At 80MHz and 800MHz, the higher range applies.
Note 2 These guidelines maynot apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

a. Field strengths from fixed transmitter, such as base stations for radio (cellular/cordless)telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strengths in the location in which the TAT 5000 series thermometer is used exceeds the applicable RF compliance level above, the TAT 5000 series thermometer should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the TAT 5000.
b. Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3V/m.
c. Portable and mobile RF communications equipment can affect performance.
d. ESD compliance has been verified by testing. Report Numbers R-5165N-1, R-5109N-1.

Guidance and manufacturer's declaration-electromagnetic immunity (cont)			
The TAT 5000 series thermometer is intended for use in the electromagnetic environment specified below. The customer or user of the TAT 5000 series should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment-guidance**
Electrostatic discharge (ESD) IEC61000-4-2	6KV contact 8KV air	6KV contact 8KV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/ burst IEC 61000-4-4	2kV for power supply lines 1kV for input output lines	Not applicable	Mains power quality should be that of a typical health care environment.
Surge IEC 61000-4-5	1kV line(s) to line(s) 2kVline(s) to earth	Not applicable	Mains power quality should be that of a typical health care environment.
Interruptions and voltage variations on power supply Input lines IEC 61000-4-11	<5% UT (>95% dip in UT) for 0,5 cycle 40% UT (60% dip in UT) for 5 cycles 70% UT (30% dip in UT) for 25 cycles < 5% UT (>95% dip in UT) for5 sec.	Not applicable	Mains power is not applicable. The TAT 5000 series is powered by battery and battery only.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at the level characteristic of a typical location in a typical health care environment.
Note UT is the a.c. mains voltage prior to the application of the test level			

Recommended separation distances between Portable and mobile RF communication equipment and the TAT 5000 Series

The TAT 5000 series forehead thermometer is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled or the user of the TAT 5000 series thermometer can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters)and the TAT 5000 series thermometer as recommended below, according to the maximum output power of the communications equipment.

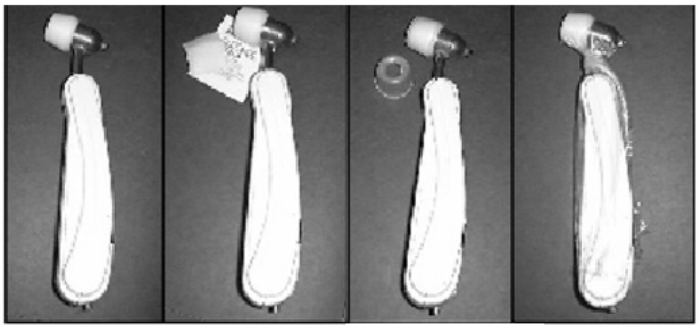
Rated maximum output power of transmitter (W)	**Separation distance according to frequency of transmitter m**		
	150 KHz to 80 MHz $d=1,2\ P^{1/2}$	**80 MHz to 800 MHz** $d=1,2\ P^{1/2}$	**800 MHz to 2,5 GHz** $D=2.3\ P^{1/2}$
0,01	0,12	0,12	0,23
0,1	0,38	0,38	0,73
1	1,2	1,2	2,3
10	3,8	3,8	7,3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance din meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.
Note 1 At 80 MHz and 800 MHz the separation distance for the higher frequency range applies.
Note 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Accessories

Disposable Cover Options

(Model Illustrated: TAT-5000)



No Cover	No Cover	Probe Cap	Full Sheath
Terminal Cleaning at Patient.	Disinfectant Wipe Between Patients.	Covers Entire Probe.	Covers Entire Instrument.

Model TAT-5000 All Options

Accessories

1. Combination Unit
   PN 134200
2. Instrument Holder (shown with security cable)
   PN 134201
3. Cap Dispenser
   PN 134202
4. Disposable Caps
   PN 134203
5. Security Cables
   8 ft. coiled cable PN 124309
   8 ft. coiled cable - Latex free - PN 124311
   6 ft. vinyl-covered steel - PN 134302
   8 ft. vinyl-covered steel - PN 134030
6. Keyless Self-Locking Wall Mount
   PN 124305
7. Keyless Self-Locking Wall Mount
   (shown with resposable cap dispenser)
   PN 124306

The TAT-5000 can be used with either disposable caps or full sheath.
Can be used without disposables if terminally cleaned or probe head disinfectant wipe between patients.
Disposables are single patient use.

*Specifications	TAT-5000
Clinical Accuracy	±0.2° F or 0.1° C Per ASTM E1112
Temperature Range	61 to 110° F (16 to 43°C)
Arterial Heat Balance Range for Body Temperature*	94 to 110° F (34.5 to 43° C)
Operating Environment	60 to 104° F (16 to 40° C)
Resolution	0.1° F or C
Response Time	~ 0.04 seconds
Battery Life	15,000 readings**
Time Displayed on Screen	30 seconds
Size	2.0" x 8.0" x 1.25" (5 cm x 20 cm x 3 cm)
Weight	7.5 oz (213 gm)
EMI and RFI Protection	Complete copper coating on inside of casing
Display Type and Size	Large bright LED's
Construction Method	• Industrial duty impact resistant casing • Hermetically sealed sensing system • stainless steel probe

Complies with EN 60601-1 3rd edition

*Automatically applied when temperature is within normal body temperature range, otherwise reads surface temperature.

** Approximate number of readings when scanning for 5 seconds and reading the temperature display for 3 seconds before turning thermometer off.

Consult Instructions for Use.

Symbol for Date of Manufacture

Symbol for Manufacturer

Type BF Applied Part

Attention, Consult Accompanying Documents or Caution.

"On" (only for part of Equipment)

Do not throw this device or accessories away in the trash, contact Exergen Corp. for disposal and recycling instructions.

IPXO Ordinary Equipment

Degree of Protection Against Electric Shock Type BF, Battery Operated

EXERGEN
Straight From the Heart®

EXERGEN CORPORATION • 400 PLEASANT STREET • WATERTOWN, MA 02472 • PH (617) 923-9900
www.exergen.com

http://www.exergen.com/medical/product/accessories.html